

**KOFORIDUA POLYTECHNIC**  
**DEPARTMENT OF APPLIED MATHEMATICS**

**YEAR:** 2010/2011

**SEMESTER:** 2

**COURSE TITLE:** Operations Research (STA 324)

**NO. OF CREDIT HOURS:** 3

**NAME OF LECTURER:** G.K. Abledu

**MODE OF DELIVERY:** Lecture/Discussion/Field work /Power Point Presentation/Use of Software

**COURSE OBJECTIVES:** At the end of the module, students would be able to use Operations Research Techniques to analyse business data.

**AREA OF COVERAGE:**

**1.0. Historical background of Operations Research (OR)**

**2.0. Linear Programming (LP)**

- 2.1. Linear programming models
- 2.2. Graphical method of solving LP models of two variables.
- 2.3. Converting inequalities to equalities using slack variables.
- 2.4. Application of Gauss Jordan's method to systems of equations
- 2.5. Simplex method of solving LP models of more than two variables
- 2.6. The primal and the dual
- 2.7. Sensitivity analysis
- 2.8. Dual prices

**3.0. Transportation Problems**

- 3.1. Transportation models
- 3.2. Algorithm for solving transportation problems
  - i. Least cost first rule
  - ii. Vogel's Approximation Method (VAM)
- 3.3. Least time transportation problems

**4.0. Assignment Problems**

- 4.1. Assignment models
- 4.2. Algorithm for solving assignment problems
  - i. Least cost first rule

**5.0. Inventory control**

- 5.1. Terminologies for Inventory models
- 5.2. Inventory models
  - i. .EOQ
  - ii. Quantity discount model
  - iii. Production quantity model

## 6.0. Network Analysis

- 6.1. Network diagrams
- 6.2. Critical Path Analysis/Method (CM/CPA)
- 6.3. Project evaluation Review Technique(PERT)

## 7.0 Waiting-Line System

### 7.1. Characteristics of waiting-line system

- Arrivals to the system
- Queue discipline
- Service facility

### 7.2. Queuing models

- Single-channel queuing model
- Multiple-channel queuing model
- Constant service time queuing model
- Limited population queuing model

## 8.0. Simulation

## ASSESSMENT

Individual quiz	}	40 marks
Group assignment		
Mid semester examination		60 marks
End of semester examination		

## REFERENCE

- Bancroft, G. and O'Sullivan, G. (1993): Quantitative Methods for accounting and Business Students. McGraw-Hill Book Company, London.
- Bonini, C.P; Hausman, W.H. and Bierman H.(1997): Quantitative Analysis for Management. McGraw Hill, N.Y.
- Curwin, J. and Slater, R. (2000): Quantitative Methods for Business Decisions. International Thomas Business Press, New York
- Heizel, J. & Render, B.(1999) Operations Management. 4<sup>th</sup> Ed. Prentice Hall Inc., USA.
- Lieberman, G.J. & Hiller, F.S.(1986). Introduction to Operations Research. 4<sup>th</sup> Ed McGraw-Hill Publishing Company, New York
- Lucey, T. ( 1996). Quantitative techniques. 5<sup>th</sup> Ed. Aldine Place, London
- Phillips, D.T. ;Ravindram, A., & Solberg, J.J., (1976). Operations Research. Principles and Practice. John Wiley & sons Inc, New York.
- Schonberger, R.J. & Knod, E.M.( Jr.)( 1994 ). Operations Management. Continuous Improvement. 4<sup>th</sup> Ed. Irwin Inc., USA.
- Tahan, H.A.(1992). Operations Research. McMillan publishing company Inc. USA.